

PATENT COOPERATION TREATY  
PCT  
INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY  
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>A3-258PCT</b>	<b>FOR FURTHER ACTION</b> See Form PCT/PEA/416	
International application No. <b>PCT/US2004/002820</b>	International filing date ( <i>day/month/year</i> ) <b>29.01.2004</b>	Priority date ( <i>day/month/year</i> ) <b>29.01.2003</b>
International Patent Classification (IPC) or national classification and IPC <b>H01R4/02</b>		
Applicant <b>MOLEX INCORPORATED et al.</b>		

<ol style="list-style-type: none"> <li>This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</li> <li>This REPORT consists of a total of 5 sheets, including this cover sheet.</li> <li>This report is also accompanied by ANNEXES, comprising:           <ol style="list-style-type: none"> <li><input type="checkbox"/> <i>(sent to the applicant and to the International Bureau)</i> a total of sheets, as follows:               <ul style="list-style-type: none"> <li><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</li> <li><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</li> </ul> </li> <li><input type="checkbox"/> <i>(sent to the International Bureau only)</i> a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</li> </ol> </li> </ol>
<ol style="list-style-type: none"> <li>This report contains indications relating to the following items:           <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Box No. I Basis of the opinion</li> <li><input type="checkbox"/> Box No. II Priority</li> <li><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</li> <li><input type="checkbox"/> Box No. IV Lack of unity of invention</li> <li><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</li> <li><input type="checkbox"/> Box No. VI Certain documents cited</li> <li><input type="checkbox"/> Box No. VII Certain defects in the international application</li> <li><input type="checkbox"/> Box No. VIII Certain observations on the international application</li> </ul> </li> </ol>

Date of submission of the demand <b>23.07.2004</b>	Date of completion of this report <b>26.01.2005</b>
Name and mailing address of the international examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer <b>Corrales, D</b> Telephone No. +31 70 340-2645



10/537926

**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/US2004/002820

JC20 Rec'd PCT/PTO 07 JUN 2005

**Box No. I Basis of the report**

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
  - This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
    - international search (under Rules 12.3 and 23.1(b))
    - publication of the international application (under Rule 12.4)
    - international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements\*** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

**Description, Pages**

1-6 as originally filed

**Claims, Numbers**

1-14 as originally filed

**Drawings, Sheets**

1/8-8/8 as originally filed

a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3.  The amendments have resulted in the cancellation of:
  - the description, pages
  - the claims, Nos.
  - the drawings, sheets/figs
  - the sequence listing (*specify*):
  - any table(s) related to sequence listing (*specify*):
4.  This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
  - the description, pages
  - the claims, Nos.
  - the drawings, sheets/figs
  - the sequence listing (*specify*):
  - any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/US2004/002820

**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes:	Claims	1-14
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-14
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-14
	No:	Claims	

**2. Citations and explanations (Rule 70.7):**

**see separate sheet**

**INTERNATIONAL PRELIMINARY  
REPORT ON PATENTABILITY  
(SEPARATE SHEET)**

International application No.

PCT/US2004/002820

**Re Item V.**

- 1 The following documents are referred to in this communication:

D1 : US 5 997 317 A (PEI WEN-CHUN ET AL) 7 December 1999 (1999-12-07)

- 2 Document D1, which is considered to represent the most relevant state of the art, discloses:

An electrical connector for connecting between an electronic component and a circuit board via a plurality of solder balls soldering onto the circuit board, comprising an insulative housing forming a mounting surface adjacent to the circuit board and a receiving surface for supporting the electronic component, the insulative housing defining a plurality of terminal channels extending through the mounting surface and the receiving surface; and a plurality of conductive terminals respectively received in the corresponding terminal channels, the terminals having a mounting portion to locate the solder ball

From this, the subject-matter of independent claim 1 and claim 8 differs in that:

The conductive terminal has a first wall, a second wall connecting with the first wall and a third wall connecting with the second wall opposite to the first wall, a mounting portion comprising a first horizontal portion extending and bending from one end of the first wall towards the third wall, and a second horizontal portion on the third wall and corresponding to the first horizontal portion towards the first wall, a gap defined between an end of the second horizontal portion and an end of the first horizontal portion near the second horizontal portion so that the first and second horizontal portions form a structure for locating the solder ball.

- 2.1 The subject-matter of claim 1 and claim 8 is therefore novel (Article 33(2) PCT)  
The problem to be solved by the present invention may be regarded as:

Providing a terminal with improved location and connection of a solder ball

- 2.2 The solution to this problem proposed in claim 1 and in claim 8 of the present

**INTERNATIONAL PRELIMINARY  
REPORT ON PATENTABILITY  
(SEPARATE SHEET)**

International application No.

**PCT/US2004/002820**

application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons:

The terminal provides in a simple manner an improved mounting portion for the solder ball. There is no hint for this solution in the prior art.

- 2.3 Claims 2-7 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.
- 2.4 Claims 9-14 are dependent on claim 8 and as such also meet the requirements of the PCT with respect to novelty and inventive step.
3. The invention relates to a conductive terminal and a connector with such terminals which have obviously an industrial applicability.

537926

## PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY  
(Chapter II of the Patent Cooperation Treaty)

25 JAN 2005

WIPO PCT

07 JAN 2005

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference A3-258PCT	<b>FOR FURTHER ACTION</b>	
See Form PCT/IPEA/416		
International application No. PCT/US2004/002820	International filing date (day/month/year) 29.01.2004	Priority date (day/month/year) 29.01.2003
International Patent Classification (IPC) or national classification and IPC H01R4/02		
Applicant MOLEX INCORPORATED et al.		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

3. This report is also accompanied by ANNEXES, comprising:

- a.  *(sent to the applicant and to the International Bureau)* a total of sheets, as follows:
  - sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
  - sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
- b.  *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s)), containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

- Box No. I Basis of the opinion
- Box No. II Priority
- Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- Box No. IV Lack of unity of invention
- Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- Box No. VI Certain documents cited
- Box No. VII Certain defects in the international application
- Box No. VIII Certain observations on the international application

Date of submission of the demand 23.07.2004	Date of completion of this report 26.01.2005
Name and mailing address of the International preliminary examining authority:   European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer  Corrales, D Telephone No. +31 70 340-2645



**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/US2004/002820

**Box No. I Basis of the report**

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
  - This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
    - international search (under Rules 12.3 and 23.1(b))
    - publication of the international application (under Rule 12.4)
    - international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements\*** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

**Description, Pages**

1-6 as originally filed

**Claims, Numbers**

1-14 as originally filed

**Drawings, Sheets**

1/8-8/8 as originally filed

- a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3.  The amendments have resulted in the cancellation of:
  - the description, pages
  - the claims, Nos.
  - the drawings, sheets/figs
  - the sequence listing (*specify*):
  - any table(s) related to sequence listing (*specify*):
4.  This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
  - the description, pages
  - the claims, Nos.
  - the drawings, sheets/figs
  - the sequence listing (*specify*):
  - any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/US2004/002820

**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes:	Claims	1-14
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-14
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-14
	No:	Claims	

**2. Citations and explanations (Rule 70.7):**

**see separate sheet**

**INTERNATIONAL PRELIMINARY  
REPORT ON PATENTABILITY  
(SEPARATE SHEET)**

International application No.

PCT/US2004/002820

**Re Item V.**

- 1 The following documents are referred to in this communication:

D1 : US 5 997 317 A (PEI WEN-CHUN ET AL) 7 December 1999 (1999-12-07)

- 2 Document D1, which is considered to represent the most relevant state of the art, discloses:

An electrical connector for connecting between an electronic component and a circuit board via a plurality of solder balls soldering onto the circuit board, comprising an insulative housing forming a mounting surface adjacent to the circuit board and a receiving surface for supporting the electronic component, the insulative housing defining a plurality of terminal channels extending through the mounting surface and the receiving surface; and a plurality of conductive terminals respectively received in the corresponding terminal channels, the terminals having a mounting portion to locate the solder ball

From this, the subject-matter of independent claim 1 and claim 8 differs in that:

The conductive terminal has a first wall, a second wall connecting with the first wall and a third wall connecting with the second wall opposite to the first wall, a mounting portion comprising a first horizontal portion extending and bending from one end of the first wall towards the third wall, and a second horizontal portion on the third wall and corresponding to the first horizontal portion towards the first wall, a gap defined between an end of the second horizontal portion and an end of the first horizontal portion near the second horizontal portion so that the first and second horizontal portions form a structure for locating the solder ball.

- 2.1 The subject-matter of claim 1 and claim 8 is therefore novel (Article 33(2) PCT)  
The problem to be solved by the present invention may be regarded as:

Providing a terminal with improved location and connection of a solder ball

- 2.2 The solution to this problem proposed in claim 1 and in claim 8 of the present

**INTERNATIONAL PRELIMINARY  
REPORT ON PATENTABILITY  
(SEPARATE SHEET)**

International application No.

PCT/US2004/002820

application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons:

The terminal provides in a simple manner an improved mounting portion for the solder ball. There is no hint for this solution in the prior art.

- 2.3 Claims 2-7 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.
- 2.4 Claims 9-14 are dependent on claim 8 and as such also meet the requirements of the PCT with respect to novelty and inventive step.
3. The invention relates to a conductive terminal and a connector with such terminals which have obviously an industrial applicability.